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JOHN J SIDERIS
HITACHI AMERICA
50 PROSPECT AVENUE
TARRYTOWN NY 10591

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EXAMINER

VO, T

ART UNIT
3747

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

08/931,172

Applicant(s)

HUNT et al

Examiner

HIEU T. VO

Group Art Unit

3402

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Response

A SHORTENED STATUTORY PERIOD FOR RESPONSE IS SET TO EXPIRE THREE MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a response be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for response specified above is less than thirty (30) days, a response within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for response is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to respond within the set or extended period for response will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- ☒ Responsive to communication(s) filed on Sept. 16, 1997
- ☐ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 1-21 is/are pending in the application.
- Of the above claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 1-4, 6-13, 16, 19 and 21 is/are rejected.
- ☒ Claim(s) 5, 14-15, 17-18, and 20 is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement.

Application Papers

- ☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been received.
- ☐ received in Application No. (Series Code/Serial Number) _____.
- ☐ received in this national stage application from the International Bureau (PCT Rule 1.7.2(a)).

*Certified copies not received: _____

Attachment(s)

- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- ☐ Interview Summary, PTO-413
- ☐ Notice of References Cited, PTO-892
- ☐ Notice of Informal Patent Application, PTO-152
- ☒ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Other _____

Office Action Summary

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DETAILED ACTION

Notice to Applicants

1. Claims 1-21 are now in the case.
2. The Preliminary Amendment under 37 CFR 1.111 filed on September 16, 1997 will not be entered because this amendment does not comply with 37 CFR 1.126. In particular, there are no claims 22-37 as indicated by the applicant. Newly proposed claims 38-61 should be resubmitted as claims 22-45.

Claim Rejections - 35 U.S.C. § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3. Claims 1-3, 8-9, 16, 19, and 21 are rejected under 35 U.S.C. 102(a) as being anticipated by Hunt et al. of U.S. Pat. 5,482,023.

Regard to claims 1-3, and 8-9, Hunt et al. disclose every element of the instant claimed invention:

a fuel supply system, air intake passageway 16, throttle valve 24 (fig. 1);

a cold start device having a housing 184 (fig. 12) which connected to the air intake passage of the throttle 24 (fig. 1);

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a cold start fuel injector 40 having an inlet 122 and outlet 124 disposed in the housing (fig. 7);

a conduit fluidly coupled on one end of the intake passageway (fig. 1) and a conduit fluidly coupled on one end of cold start device (fig. 1) to provide air to the outlet 124 of the cold start fuel injector 40 for intermixing of the air and fuel (col 7 lines 60-65);

an idle speed control valve 130 which provides air flow to the engine (col. 7 lines 40-54);

a tubular and cylindrical heater 128 which is made by ceramic is provided in alignment with the outlet 124 of cold start fuel injector 40 (fig. 7) to enhances the vaporization of the fuel from the cold start fuel injector 40 (col 7 lines 31-39);

an electronic control unit (ECU) 26 which is responsive the engine temperature from sensor 30 to generates output signals to activate the cold start fuel injection 40 (col. 5 lines 23-40).

Regarding claim 16, Hunt et al. teach the switching fuel supplied by the cold start fuel injector 40 to fuel supplied by the multi-point injectors 38 when the engine reaches to temperature T2 (fig. 6 and col 7 lines 8-17).

Regarding claim 19, Hunt et al. teach the flow of air/fuel mixture is controlled by the rotational position of the throttle valve 24 (col. 5 line 64-67).

Regarding claim 21, Hunt et al. teach the gas flow through the passageway 141 between the cold start fuel injector 40 and intake manifold 13 in a swirling fashion (col 8 lines 22-31).

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Claim Rejections - 35 U.S.C. § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hunt et al. of U.S. Pat. 5,482,023 in view of Hattori et al. of U. S. Pat. 5,315,975.

Hunt et al. teach every element of the instant claimed invention:

a fuel supply system, air intake passageway 16, throttle valve 24 (fig. 1);

a cold start device having a housing 184 (fig. 12) which connected to the air intake passage of the throttle 24 (fig. 1);

a cold start fuel injector 40 having an inlet 122 and outlet 124 disposed in the housing (fig. 7);

a conduit fluidly coupled on one end of the intake passageway (fig. 1) and a conduit fluidly coupled on one end of cold start device (fig. 1) to provide air to the outlet 124 of the cold start fuel injector 40 for intermixing of the air and fuel (col 7 lines 60-65);

a tubular and cylindrical heater 128 which is made by ceramic is provided in alignment with the outlet 124 of cold start fuel injector 40 (fig. 7) to enhances the vaporization of the fuel from the cold start fuel injector 40 (col 7 lines 31-39).

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However, Hunt et al. do not disclose a throttle valve 24 is disposed in a tapered bore within the air passage 16.

Nevertheless, Hattori et al. disclose a throttle valve 5 is disposed in a tapered bore within the air passage 4 (fig. 1).

Therefore, it would have been obvious to one of the ordinary skill in the art at the time the invention was made to provide the air passage 16 of Hunt et al. with the air passage 4 of Hattori et al. in order to assure smooth rotation of the throttle valve.

5. Claims 1 and 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hunt et al. of U. S. Pat. 5,482,023 in view of Shriner et al. of U. S. Pat. 5,322,043.

Hunt et al. teach every element of the instant claimed invention:

- a fuel supply system, air intake passageway 16, throttle valve 24 (fig. 1);

- a cold start device having a housing 184 (fig. 12) which connected to the air intake passage of the throttle 24 (fig. 1);

- a cold start fuel injector 40 having an inlet 122 and outlet 124 disposed in the housing (fig. 7);

- a conduit fluidly coupled on one end of the intake passageway (fig. 1) and a conduit fluidly coupled on one end of cold start device (fig. 1) to provide air to the outlet 124 of the cold start fuel injector 40 for intermixing of the air and fuel (col 7 lines 60-65);

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a tubular and cylindrical heater 128 which is made by ceramic is provided in alignment with the outlet 124 of cold start fuel injector 40 (fig. 7) to enhances the vaporization of the fuel from the cold start fuel injector 40 (col 7 lines 31-39).

However, Hunt et al. do not disclose the passageway surface 141 configured in the shape of spiral or corkscrew.

Nevertheless, Shriner et al. disclose the passageway surface 20 configured in the shape of spiral or corkscrew (figs. 2, 3a-c).

Therefore, it would have been obvious to one of the ordinary skill in the art at the time the invention was made to provide the passageway surface 141 of Hunt et al. with the passageway surface 20 of Hattori et al. in order to effectively swirls the gas flow to the combustion chamber.

6. Claims 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hunt et al. of U.S. Pat. 5,482, 023 in view of Hunt et al. of U. S. Pat. 5,529,035.

Hunt et al. of U. S. Pat. 5,482, 023 teach every step of the instant claimed invention:

fuel is supplied to the engine through the cold start fuel injector 40 (col. 6 lines 35-40);
mixing fuel from the cold start fuel injector 40 and air to produce a stoichiometric ratio of the air to fuel (col. 2 lines 23-29, col. 6 lines 35-40);
passing through air fuel mixture over heater 128 to enhance vaporization (col. 7 lines 34-39, col 8 lines 33-36);
air fuel mixture is supplied from the cold start fuel injection 40 to the engine cylinders when the engine is started, until the engine reaches a temperature T_2 (fig. 6 block 116);

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switching fuel supplied by cold start fuel injector 40 to fuel supplied by multi-point injectors 38 after the engine reach a threshold temperature (col 7 lines 8-17).

However, Hunt et al. do not teach the step of initiating power to the heater 128 before the engine is ignition.

Nevertheless, Hunt et al. of U.S. Pat. 5,529,035 teach the step of initiating power to the heater 24 before the engine is ignition (col. 5 lines 1-6).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the step of initiating power to the heater 128 of Hunt et al. with the step of initiating power to the heater 24 in order to allow heater warm up.

7. With regard to claimed discontinuing power to the heater after switching from cold start fuel injection to plurality of fuel injections, suspending power to the heater while the engine is being cranked during engine start up in claims 11-13, they are well-known to one of ordinary skill in the art.

8. The unentered claims 38-61 are still rejectable and would have been rejected under 35 U.S.C. 103(a) as being unpatentable over Hunt et al. (5,482,023 and 5,529,035).

Hunt et al. (5,482,023) teach every step of the instant claimed invention such as suppling fuel to the engine through a cold start fuel injector; mixing fuel from the cold start fuel injector and air to produce stoichiometric ratio of fuel and air. However, Hunt et al. (5,482,023) do not teach the step of initiating power to a heater before the engine is ignition. Hunt et al. (5,529,035) teach the step of initiating power to the heater before the engine is ignition. Therefore, it would

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have been obvious to one of the skill in the art at the time the invention was made to provide the step of initiating power to the heater of Hunt et al. (5,529,035) in order to warm up the heater quickly.

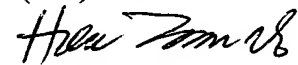
Allowable Subject Matter

9. Claims 5, 14-15, 17-18, and 20 are objected to as being dependent upon a rejected base claim, but would be allowable subject matter if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicants are advised that these allowable claims are subject to double patenting rejection by patent claims of the parent case (08/679,273 filed on July 12, 1996).

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Hieu T. Vo whose telephone number is (703) 305-6800. The examiner can normally be reached on Monday through Friday from 7:30 AM - 4:00 PM.

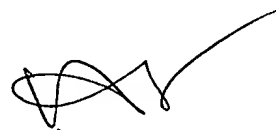
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Henry C. Yuen, can be reached on (703) 308-1946. The fax phone number for this group is (703) 308-7764.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0861.



HIEU T. VO
Patent Examiner
Art Unit 3402

HTV
March 19, 1998



HENRY YUEN
SUPERVISORY PATENT EXAMINER
GROUP 3400